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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/630,915	08/02/2000	Monsieur Bernard Bidet	33396-070337.0205	7905

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EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 01/28/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

SW

Office Action Summary	Application No. 09/630,915	Applicant(s) BIDET, MONSIEUR BERNARD	
	Examiner Justin R Fischer	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because (a) the abstract is two pages long and (b) the abstract contains more than 150 words. Correction is required.

See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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With respect to claims 2-11, applicant has attempted to draft claim 2 in a manner that further limits the materials and composition of the intermediate elastomeric layer defined in claim 1. However, depending on the selection of VA (vinyl aromatic chains), claim 2 actually defines a variety of ranges that create a broader range in the dependent claim. For example, if VA=20% then claim 1 requires that D is greater than 35 but less than 83.2. In addition, claim 2 would require that D is greater than 34.4 but less than 89.8. As such, dependent claim 2 creates a broader range for the value D (1,2 bond in diene chains). A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 5,280,817) in view of Nakamura (US 6,333,375) and Russell (GB 2,198,138). As best depicted in Figure 1, Liu teaches a pneumatic tire construction having an inner elastomeric layer **25** (innerliner), a reinforcing cord ply or carcass structure **15**, and an intermediate reinforcing layer or barrier layer **37** between said innerliner and said carcass structure. Furthermore, Liu suggests that said barrier layer can be formed from a variety of elastomers and rubber additives, such as natural rubber (polyisoprene), synthetic cis-polybutadiene, and styrene butadiene (copolymer of conjugated diene and vinyl aromatic polymer) (Column 2, Lines 57-65). In describing the rubber additives, Liu defines the use of carbon black, silica, antidegradants (antioxidants), zinc oxide, stearic acid, and sulfur. However, Liu is silent with respect to the specific elastomeric blend defined by the claimed invention (polyisoprene and diene/vinyl aromatic copolymer) and thus necessarily fails to establish the quantitative relationships between the 1,2 bond content and the vinyl aromatic chain content. Also, Liu does not detail the specific carbon black used (no absorption or surface area values are provided). Regarding the carbon black properties, the quantitative relationship provided by applicant defines a conventional filler composition. For example, Nakamura defines a wide range for both the absorption and surface area that would anticipate the broad quantitative relationship established in claim 1 (Column 12, Lines 41-50). With respect to the specific blend, it would have been obvious to one of ordinary skill in the

art at the time of the invention to form the barrier layer from a mixture of natural rubber and styrene butadiene (individual components are mentioned by Liu) because such mixtures are extensively used to promote adhesion and provide an air impermeable quality. For example, Russell defines an improved rubber mixture composition for the carcass topping rubber composed of natural rubber and styrene butadiene that is designed to reduce the passage of air through the carcass (Page 2, Lines 22-30). As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the barrier layer of Liu out of the claimed elastomeric mixture (polymer and additive composition), as suggested by Nakamura and Russell, for the reasons set forth below.

As mentioned above, Figure 1 of Liu clearly depicts the use of a barrier layer between the innerliner and the carcass structure. However, Liu suggests a variety of elastomers and additives, including natural and styrene butadiene, but fails to describe the use of a mixture of the elastomers. It should be initially noted that Liu does not exclude the use of a mixture of polymers but rather fails to expressly state that such a blend represents an alternative barrier layer composition. In any event, the aforementioned elastomers are conventionally mixed to form a variety of tire components, including the innerliner and associated air impermeable layers. For example, Russell defines the use of a natural rubber / styrene butadiene rubber for the carcass topping rubber in order to impart high adhesive strength and air impermeability. Though this layer is not an innerliner or a barrier layer, it is clearly evident that the combination or mixture of polyisoprene and styrene butadiene provides similar qualities

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(adhesion and air impermeability) to that desired in an innerliner or barrier layer. In particular, the barrier layer would be expected to have natural rubber due to its ability to increase the bond between the innerliner and the carcass structure. As such, one of ordinary skill in the art at the time of the invention would have readily appreciated the barrier layer of Liu to be formed from the claimed mixture since the benefits of said mixture are desired in the barrier layer.

With respect to the carbon black, Liu only suggests that carbon black is a conventional additive in barrier rubber layers. Though the reference is silent regarding the absorption and surface area, the quantitative relationships of claim 1 represent conventional filler compositions. First, the broad range of 25-85 phr for carbon black is extremely conventional and well known in similar rubber layers. Second, the quantitative relationship between the surface area and the DBP absorption level defined by claim 1 suggests a variety of embodiments that one of ordinary skill in the art at the time of the invention would have readily appreciated and expected. For example, Nakamura (Column 12, Lines 41-50) states that the surface area for carbon black can vary between 5 and 200 m²/g (preferably between 50 and 150) and the DBP absorption level can vary between 5 and 300 ml/100 g (preferably between 50-200). As such, it is clearly evident that a variety of embodiments would fall within the range defined by applicant (one such example is the lower limits of each preferred range). For example, if the surface area (BET) was 50 m²/g, then the absorption level (DBP) would have to be less than or equal to ¹⁴⁶136 ml/100g, well within the broad range and preferred range of Nakamura. Therefore, it is the examiner's position that one of ordinary skill in the art

at the time of the invention would have been able to optimize the barrier rubber composition by selecting a carbon black that satisfied the broad and conventional ranges outlined by the claimed invention.

Lastly, applicant has defined four quantitative relationships (i-iv) with respect to the copolymer. First, both (iii) and (iv) require that the 1,2 bond content and the vinyl aromatic content, respectively, are greater than 10%. It is the examiner's position that these values are extremely conventional in tire rubber components, and as such, would have been readily appreciated and expected by one of ordinary skill in the art at the time of the invention. Second, applicant defines very broad ranges to relate the aforementioned bond/chain contents (i) and (ii). For example, in taking a conventional value of 20% for VA, the quantitative relationship requires that D is between 25 and 83.2, which defines a large range of conventional values for the 1,2 bond content. Additional conventional values, such as 35% for VA, suggest that D would have to be between 0 and 58, which again defines a broad and conventional range for the 1,2 bond content. Thus, it is evident that the quantitative relationships defined by applicant are satisfied by several embodiments in which the bond/chain contents take on conventional values. Furthermore, applicant has not established any criticality in the formation of the aforementioned quantitative relationships that would define over the use of conventional bond/chain content values.

With specific respect to claim 2, it should be noted that natural rubber, which is suggested by Liu, generally has a cis 1,4 bond content that is extremely high, very often above 90%. Though not expressly stated, it is the examiner's position that the natural

rubber suggested by Liu would have a cis 1,4 bond content to satisfy the limitations of the claimed invention.

With respect to claim 11, applicant requires that the barrier layer have a thickness between 1 and 4 millimeters. The barrier layer of Liu (37) contains two contour zones (27,28) in which the thickness obtains a maximum value. In defining the thickness, Liu states that it should range between 10 and 30% of the total sidewall thickness. It is clearly evident that the barrier layer thickness is dependent on the type of tire. However, it is clearly evident that the broad range defined by applicant incorporates a variety of conventional embodiments. For example, if the sidewall thickness were 20 mm, then Liu requires the contour thickness to be between 2.0 and 6.0 mm. Additionally, even if the sidewall thickness were 30 mm, then Liu requires the contour thickness to be between 3.0 mm and 9.0 mm. As such, it is evident that Liu defines several embodiments where the barrier layer or contour thickness is between 1 and 4 mm as required by the claimed invention. One of ordinary skill in the art at the time of the invention would have recognized the plurality of embodiments and been able to optimize the air impermeable quality while maintaining weight/performance requirements by forming the barrier layer within applicant's claimed range.

8. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu, Nakamura, and Russell as applied to claim 1 above, and further in view of Materne (US 6,156,822). As previously mentioned, Liu in view of Nakamura and Russell suggest all the limitations of the claimed invention, including the use of a carbon black and silica. Furthermore, Nakamura suggests a surface area range for common silica components

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of between 50 and 400 m²/g (preferably between 120 and 190), which falls within applicant's broad range (Column 12, Lines 21-31). Also, with specific respect to claim 3, Nakamura states that the use of silica with carbon black represents a preferred embodiment in which the reinforcement is optimized (Column 12, Lines 63-67). However, the references do not address the presence of surface agents, such as AlOH or SiOH. In any event, such surface materials are conventionally used with carbon black (forms modified carbon black) and silica to more effectively reinforce the particular filler. For example, Materne states that both carbon black and precipitated silica can have surface agents in the form of either aluminum or silica hydroxide (Column 5, Lines 8-13). It should be noted that the use of such surface agents is not limited to the tread portion since the increase in reinforcement capability is desired in all rubber tire components, including the barrier layer. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the claimed conventional surface agents, as suggested by Materne, in the general tire construction of Liu in view of Nakamura and Russell, for the reasons detailed above.

With specific respect to claims 3 and 5, applicant requires that the silica and modified carbon black be used in an amount less than 50 phr. This quantity defines a conventional value for filler compositions in a variety of rubber tire components, including the innerliner. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a barrier layer composition with the claimed filler quantities. Also, one of ordinary skill in the art at the time of the invention

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would have been able to optimize the filler reinforcement by varying the filler quantities within the conventional range defined by applicant.

9. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu, Nakamura, and Russell as applied to claim 1 above, and further in view of Topcik (US 3,639,308). As stated above, Liu in view of Nakamura and Russell suggest all the limitations of the claimed invention, including the conventional use of antidegradants (antioxidants), zinc oxide, stearic acid, and sulfur in barrier rubber compositions (Column 2, Lines 57-67). However, the reference does not describe the specific quantities of each additive. In any event, applicant has defined ranges that represent conventional values in similar air impermeable layers (innerliners), as evidenced by Topcik (Columns 2 and 3). Thus, in forming the barrier rubber layer of Liu, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the aforementioned additives in the claimed quantities since they define conventional values, as suggested by Topcik and further detailed below.

Regarding claim 6, though the reference does not expressly state the type and quantity of antioxidant, p-phenylene diamine is conventionally used in an amount between 1 and 5 phr to reinforce the innerliner and similar air impermeable layers. Topcik defines the use of a rubber antioxidant between 1 and 4 phr for innerliners (Column 2, Lines 59-67) and similar values would have been expected by one of ordinary skill in the art at the time of the invention for related air impermeable layers or barrier layers. Lastly, though p-phenylene diamine is not specifically mentioned, this antioxidant is used extensively in rubber tire components and its use in the barrier layer

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of Liu would have been readily appreciated and expected by one of ordinary skill in the art at the time of the invention.

Regarding claim 7, Liu suggests the use of accelerators in barrier rubber layer compositions (Column 2, Lines 65-68). Furthermore, Topcik states that such additives should be used in an amount between 0.5 and 2.0 phr (Column 2, Lines 59-67).

Though the reference does not specifically mention the use of metal salts, such an additive is conventionally used as an accelerator (in conjunction or without stearic acid). Therefore, the metal salts defined by the claimed invention represent conventional materials and quantities that one of ordinary skill in the art at the time of the invention would have readily appreciated.

With respect to claim 8, Liu does suggest the use of stearic acid but is silent with respect to the quantity employed. However, stearic acid is conventionally used in a small amount that mirrors the range defined by applicant. As suggested by Topcik, a curing accelerator, such as stearic acid (Column 3), is to be used in an amount between 0.5 and 2 phr (Column 2, Lines 59-67).

Regarding claim 9, Liu suggests that zinc oxide is used in the barrier rubber composition but is silent regarding how much should be incorporated. In any event, zinc oxide is conventionally employed in an amount that is greater than 2 phr, as required by the claimed invention. Topcik describes the use of zinc oxide in multiple embodiments such that the quantity is 5 phr, which meets the limitations of the claimed invention.

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With respect to claim 10, Liu does suggest the use of sulfur in the barrier rubber layer. Though the exact quantity is not detailed, applicant's range defines conventional values for such an additive. For example, Topcik suggests values for sulfur between 0.75 and 2.5 phr, which incorporates a significant portion of the conventional range defined by applicant.

Conclusion


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(703) 605-4397**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Justin Fischer

January 23, 2002


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700